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WHAT AND HOW.

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A GUIDE TO SUCCESSFUL ORAL TEACHING.

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WHAT AND HOW:

A GUIDE TO

SUCCESSFUL ORAL TEACHING.

BY

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LONDON:

BLACKIE & SON, 49 & 50 OLD BAILEY, E.C.

GLASGOW, EDINBURGH, AND DUBLIN.

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PREFACE.

The method of Oral Teaching is one which is employed more or less in all schools, but the value of which is perhaps seldom fully appreciated. Even teachers who most frequently adopt it do not always obtain results commensurate with their efforts, from a want of thoroughly grasping the general principles which underlie the method, and which should guide them in the choice of questions.

To explain and illustrate these principles has been the object of the writer, and he believes he has produced a book which will be found well worth the careful study of Pupil-teachers and Students, whatever kind of school they may ultimately hope to occupy.

Considerable attention has been paid to the subject of "Interrogation," and an attempt has been made to show what is meant by a chain of questions. It may interest and encourage the student to know that the three examples given were really worked out with a class by the author. All the examples of bad questions and faulty sketches are genuine, having been taken from exercises written by students in training.

The "Pattern Sketches," though somewhat limited in number for want of space, are fairly representative, each being on a different subject. It will be easy for students to construct others on the same plan.

It is hoped that *What and How* may prove a useful Text Book, and find its way into the hands of Students in Training Colleges, Pupil-teachers, and Assistants in Elementary Schools. If the study of its contents should conduce to the improvement of the methods of teaching, the author will be thankful that he has now done with his pen what in former years it was his privilege to do with his voice.

J. H.

May, 1887.

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CONTENTS.

Chap.		Page
I.	Introduction. Causes of Failure in Oral Teaching,	7
II.	Aids to Successful Oral Teaching,	9
	Rules for Intelligent Sketch Writing,	10
	Notes of Object Lesson on the Hedgehog,	18
	„ „ Cotton,	19
III.	Method in relation to Teaching,	21
IV.	The Teacher's Instruments—Interrogation,	25
	Examples of Questioning,	27, 36
	Rules for the Formation of Questions,	31
V.	The Teacher's Instruments (Continued)—Illustration,	45
	Examples and Sources of Illustration,	46, 48
	Rules for Use of Illustrations,	49
VI.	The Teacher's Instruments (Continued):	
	Exposition—its Conditions of Success,	50
	Explanation—Common Defects in,	52
	Description—Conditions of Success, and Materials for,	53
VII.	Pattern Sketches of Lessons:	
	Lesson on the Cone,	56
	„ a Rule of Spelling,	57
	„ Classification of Verbs,	58
	„ Nominative and Objective Cases of Nouns,	60
	„ a Hen's Egg,	61

CHAP. Page

VII. PATTERN SKETCHES OF LESSONS (Continued):

Lesson on the Cat, - - - - - - - 63
,, the Daisy, - - - - - - - 65
,, Bodies Fibrous and Friable, - - 67
,, the Mental Multiplication of 2, - - 69
,, Division by 2 mentally, - - - 70
,, the Idea of a Fraction, - - - 71
,, the Table of Square Measure, - - 73
,, the Idea of an Adverb, - - - 76

Example of Method of dealing with Explanatory Reading for Upper Standards, - - - 78

INDEX, - - - - - - - - - - 80

WHAT AND HOW:

A GUIDE TO SUCCESSFUL ORAL TEACHING.

CHAPTER I.—INTRODUCTION. CAUSES OF FAILURE IN ORAL TEACHING.

In the Kindergarten and Infant Schools most of the instruction given to the children must of necessity be by word of mouth, or by what is generally called "Oral Teaching." The same method has at times to be adopted with elder children. Much, however, of what goes by that name is often a mere talk about a subject which is passing through the teacher's mind, but which is not lodged in the minds of those addressed. When such exercises are judged by the rules of teaching they are found to be failures. The cause of the failure is in the teachers themselves, and arises mainly from ignorance: ignorance of what is included in the term *Teaching*, and ignorance of the real nature of *Instruction*. To remove this ignorance is the object of the following pages.

FIRST. **The Nature of Teaching.**

1. Teaching is not the mere storing the memory with words, but it is the development of ideas, which ideas may be regarded as so many mental forces enabling those who possess them to perform mental work on their own account.

It is a comparatively easy matter to enable children to repeat mechanically a rule of arithmetic or a formula of science, but those who help the children to acquire such words are not worthy the name of teachers; nor does the

ability on the part of the children to repeat the words—the result of the work of others—give them the power to solve a problem in number, or perform an experiment in physics. In other words, the children would not by such a process acquire the power to work for themselves, yet this ability *to do* is the aim and end of all true teaching.

2. Teaching is not merely leading children to think at one particular lesson and not to think at all at another, but it is training children to think at all lessons, and so helping them to form the habit of thinking.

Students must bear in mind that mental habits like all other habits are formed by constant repetition of the same actions. If, then, at every oral lesson children are trained to think for themselves, they will acquire the habit of thinking, and as the formation of this habit is one of the objects of true teaching, every oral lesson should contribute its quota towards this mental discipline.

3. Teaching when properly conducted always results in the pupils learning something new about the subject of the lesson; and this learning is, as has been shown, the act of the pupils themselves.

In order that teachers may aid the children in acquiring the power to work for themselves and thus acquire the habit of thinking, they must place the subject of the lesson before the mind in an attractive manner; they must adopt good methods, and use proper instruments. But more of this in subsequent pages.

SECOND. **The Nature of Instruction.**—What is involved in the term *instruction* will best be seen by analysing the word itself. The noun "instruction" is derived from the transitive verb "instruct," which is itself derived from the Latin verb *instruo* (*in*, and *struo*, to join together, to pile up, to form a structure). An *instructor*, therefore, in the time of the Romans was a builder, one who constructed material according to a set plan, and

his work was characterized by order, symmetry, and durability. Applied to teaching the word signifies the act of transferring the ideas from one person's mind to the mind of another; and this in such a way that the new ideas become a part of the mental nature of the recipient. A true instructor, then, is an idea builder: one who builds *in* the mind, not *upon* it: not one who merely fills the memory with words, but one who, so to speak, sets up mental forces in the individual instructed.

If the brain were a mere hollow cavity, designed to hold a certain number of words, then any person possessing a stock of words would be able to fill the cavity; no skill would be required. The brain, however, is not a hollow cavity but a complex organ, capable of being moulded by proper manipulation and invigorated by proper exercise. Brain manipulation is, however, both a delicate and a difficult work, and those who undertake it should make themselves acquainted with the nature and operations of mental phenomena, and acquire skill in dealing in mind. To obtain these qualifications they must, in the first place, study *psychology*, and, in the second place, pass through a course of practical training in the art of *teaching:* and thus attain both the knowledge and the skill necessary to make them successful workers in this department of labour.

Chapter II.—AIDS TO SUCCESSFUL ORAL TEACHING.

First. **Careful Preparation for Teaching.**—In order that Oral Teaching may possess the qualities mentioned in the previous chapter each lesson must be carefully prepared by the teacher. If "Notes of Lessons" or "Text Books" are used, the matter contained in them

should not be regarded as a number of facts to be transferred from the pages of the book to the memories of the children; but as so much crude material to be passed through the mind of the teacher, and thus elaborated into what will supply the mental wants of the children.

But teachers should not rely altogether on "Notes of Lessons" written by others: they should endeavour to get a well-stored mind on all subjects which they propose to teach. In order to possess this treasure they must pursue a course of systematic reading in history, travel, biography, and science,—especially in the science of common things. In the next place, they must cultivate the habit of careful and accurate observation of the physical features of places visited; the habits and structure of animals seen; and the occurrences of any natural phenomena that may come under their notice. And in the third place, they must make a practice of recording in a book anything noteworthy which they may see, hear, or read, in such a way as to be readily available when occasion requires. In other words, teachers should *be careful readers, diligent collectors, and accurate recorders.*

SECOND. **Intelligent Sketch Writing.**—Assuming that good and suitable matter has been collected, it should be converted into a sketch.

A somewhat large experience gained in a Metropolitan Training College has convinced us that many students find the preparation of sketches for oral teaching one of their chief difficulties. To make this part of their work easier we submit the following rules.

First Rule. *Consider the mental capacity and probable attainments of the children.*—Having done this, choose those parts of the subject which are fitted for both, and take as much of the subject as can be taught in the time allotted to the lesson.

A disregard of this rule lies at the root of many failures both in sketch writing and in lesson giving.

Second Rule. *Determine in your own mind the order in which the subject should be taught.*—In other words, make sure that your starting-point is the right one.

It may be laid down as a general principle that the proper starting-point of every lesson given to young children is that part of the subject which is nearest the experience of the child. Thus in lessons on "Common Things" the *use* of the object is nearer the child's experience than its *qualities*, and the *qualities* nearer than its *manufacture* and *commercial* value. This then should be the teaching order of such subjects.

Again, in lessons on "Natural History" the parts and habits of animals are matters which can be and are observed by children, while the life history of the creature and its place in nature lie beyond the range of their experience. Here again we see the proper teaching order of all such subjects.

Violation of the rule.—We have before us a number of sketches on "Common Things" written by students in a Training College, in which it is proposed to commence the lesson with the nature of the object and the locality in which it is found: then the qualities and uses of the object are considered.

We have also on our study-table a volume of *Notes of Lessons for Infant Teachers*, in which out of fifty lessons given, one-half are constructed on the above plan. In both cases the starting-point is the unknown and distant, and the goal to be reached is the known and present. Whereas the true teaching order should be the very reverse of this, or "*from the known to the unknown.*"

Third Rule. *Determine what is to be the special point or points of the lesson, and state the same at the head of the*

sketch.—In preparing a lesson teachers should not be concerned with what *can* be said about the subject in hand, but with *what of the subject is most suited to the children's minds and acquirements*, and what they can receive and digest in the time allotted for the lesson. A disregard of this is the cause of many mistakes made by young teachers. An example or two taken from sketches sent in to the writer for criticism will make this point clear.

Violations of this rule:

Subject—*Silk.* Age of children—*6 years.* Time at the teacher's disposal—*30 minutes.*

Points proposed to be taken up: 1. Nature of the object. 2. From what obtained. 3. History of the silkworm moth. Eggs—larva—cocoon—chrysalis—moth. 4. Home of the silkworm. 5. Use of silk. 6. Preparation of the raw silk. 7. Manufacture of silken fabrics.

Passing over, for the present at least, the defective arrangement of the lesson, we may point out that the ground covered is far too wide for the children for whom the lesson is intended, and the matter is far more than could be given in half an hour.

A second example may be added:

Subject—*Hive Bees.* Age of children—5½ *years.* Time allowed—*25 minutes.*

Points to be worked out: 1. Time of day in which bees work. 2. Instinct by which bees find (*a*) the honey, (*b*) their way back to their hives. 3. Means by which bees extract the nectar from the flowers and bring it to the home of the bees. 5. Hive bees—kinds in each hive. 6. Work of each kind. 7. Moral lessons enforced: (*a*) industry, (*b*) order, (*c*) forethought.

It does not require much educational acumen to see that if such a lesson were given it must of necessity be a failure. In the first place, it would be quite impossible

to go through all the points named in the time allotted for the lesson; and in the second place, the starting-point, the *Instinct*, is altogether beyond such young children. Yet many such lessons are attempted, and as a matter of course as many failures occur.

Fourth Rule. *Take care that the points of the lesson follow each other in their teaching order.*—The information which has been collected will naturally be placed in the teacher's mind in the order in which it has been acquired, but this order may not be the one in which it should be imparted to the children.

Teachers must therefore analyse the subject in hand, and commence with that which is simple and elementary, and so arrange their points that they may proceed by a series of well-graduated steps to that which is more difficult or complex in its character. When this is done the ideas presented will be received in their right order, their suitable connection felt, and the whole will be adjusted satisfactorily in the mind.

Violation of this rule.—The effect of disregarding this rule is sadly evident in many of the sketches prepared by young students. We give an example or two which lately came under our notice.

A. *Lesson on Coal to children of 8 years of age.* Order proposed: 1. The formation of coal. 2. Qualities. 3. The occurrence of coal. 4. Means of obtaining coal.

Here, it will be observed, the teacher proposes to start with the most difficult part of the subject,—a part too quite unfitted for young children, because it lies beyond the range of observation or experiment, and leads to the region of speculation.

The more fitting order would have been: 1. Uses to which coal is put. 2. Qualities which render it useful. 3. Where coal is found, and how obtained. For elder

children to these may be added: 4. The details of coal-mining. 5. Commercial value. And lastly, The formation of coal.

B. *Lesson on Silk to children of 6 years of age.* Order proposed: 1. Nature of silk. 2. How obtained. 3. Changes which the silkworm moth undergoes. 4. Silk-producing countries. 5. Uses of silk. 6. Manufacture of silken goods.

A better order would be: 1. Qualities of silk. 2. Uses to which it is put. 3. From what silk is obtained. And for children somewhat older, 4. How silk is prepared for use.

Fifth Rule. *Take care that the heads of the lesson are marked by clear, distinct, and broad lines, and are not too numerous.*—It must be borne in mind that minute divisions weaken a subject. We have before us several sketches written by students in which this rule has been disregarded, and, as a consequence, they are very defective. A few examples will make the matter clear.

Violation of this rule:

A. *Lesson on Cotton to infants.* Heads proposed: 1. Raw cotton. 2. The cotton pod. 3. Cotton wool. 4. Cotton threads. 5. Calico. 6. Sewing cotton. 7. Summary. 8. Recapitulation.

These divisions are not only too numerous, but very weak. The second and third are involved in the first; the fourth, fifth, and sixth belong to one division of the subject, namely the processes of manufacture.

B. *Lesson on Silk to children of 7 years of age.* Heads proposed: 1. A piece of silk, what it is. 2. How obtained. 3. The eggs of silkworm moth. 4. Larva. 5. Cocoon. 6. Chrysalis. 7. Moth. 8. Home of the silkworm. 9. Uses of silk. 10. Preparation of the raw silk. 11. Manufacture of silken goods. 12. Recapitulation. 13. Summary.

These thirteen divisions may be reduced to four: 1. Nature and sources of silk. 2. Life history of the silk-worm. 3. Preparation of the raw material. 4. Summary and exercises.

C. *Comparison of a Fox and a Dog, to children of 7 years of age.* Heads proposed: 1. Points of Difference. (1) General appearance. (2) Head. (3) Feet and toes. (4) Kind of teeth. (5) Relation of both animals. 2. Points of Resemblance. (1) Eyes. (2) Ears. (3) Tongue. (4) Tail. (5) Colour. (6) Food. (7) Disposition. (8) Uses. These sub-divisions are badly chosen. In the second main division some of the points are differences rather than resemblances, especially so Nos. (4) and (8).

Sixth Rule. *State the aim which you have in giving the lesson:* the general aim when that is not expressed in the title of the lesson itself; and the special aim at all times.

For instance, the general aim in all Bible lessons will be to produce a religious impression, and as there can be no real religious teaching without it there is no necessity to state it. But supposing a lesson to be given on the life of Jacob, say from the time when he by craft obtained the blessing of his brother Esau, the teacher might desire to lead the children to see that as he deceived his father, he was himself afterwards deceived by his own children, and thus he was an example of the truth afterwards taught by the apostle, "Whatsoever a man soweth that shall he also reap,"—the development of this particular truth would be a special aim, and should be stated.

Again, in lessons on "Objects" or "Animals," the general aim would of course be to exercise the observing powers of the children, and this need not be stated. But suppose a lesson to be given on an "Elephant," then the teacher's object might be to lead the children to see the fitness of the creature's trunk to the uses to which it is put, namely, a means of obtaining food and drink; and

so a prehensile organ—a hand in fact; then it is by the use of the trunk that the creature discovers the presence of danger, so the organ is a sentinel and at the same time it is a nostril. Such particular aim should be stated.

Again, in lessons on "Number" the general aim will of course be to cultivate mental power, and this need not be stated in a formal manner. But suppose the lesson to be on the idea of "Proportion," then the teacher's particular object should be to lead the children to discover why it is that when one member of two pairs of equal ratios is omitted the missing number can be found. This being the special aim of the lesson, it should be stated.

Violations of this rule.—The following examples taken from sketches prepared by students in training show the evil of disregarding this rule.

A. *Lesson on the Hedgehog.* Aims as stated by the student: 1. To teach the children some new facts in natural history and lead them to study it. 2. To teach them to love animals and exhibit kindness to them. 3. To strengthen their observation and their reasoning powers. 4. To lead them to new beauty and thought.

Remarks.—The first part of No. 1 is superfluous, as every lesson on animals should do that. The first part of No. 3 is also unnecessary: the second part would have been good if the means by which it was to have been accomplished were stated. No. 4 is very vague.

B. *Comparison of Dog and Fox.* Aim as stated by the student: To strengthen the power of attention, and develop the perceptive powers by exercising the senses.

Remarks.—This shows a certain amount of ignorance on the part of the student as to the nature of mind: the perceptive powers cannot be developed in any other way than by the exercise of the senses.

C. *Lesson on Silk.* Aim as stated by the student: To

lead children to find out things for themselves, and to see beauty in the meanest creature.

Remarks.—In the first place this is very vague, and in the second place what the children were to be led to find out is not stated. Then the silkworm moth is not by any means the meanest creature in the animal world, though in one sense it may be regarded as among the meanest, that is, lowly formed.

D. *The Cat Family.* Aims as stated by the student: 1. To give the children a clear conception of the distinguishing features of the cat tribe. 2. To show how all animals have been bountifully provided with all that is necessary for their several lives.

Remarks.—The first point is unnecessary as it is included in the title of the lesson. The second could not be worked out in any one lesson. The children might be led to see how the animals belonging to this particular family were so provided, but then these are only a very few among the many—the *all* in the teacher's mind.

Seventh Rule. *Pay particular attention to the style of the sketch.*—What is written should be pithy, pointed, and condensed, so that the different points may catch the eye. The facts which are to be communicated—*the What*—may as a rule be arranged in one column, and this will be the "matter." The method of working out the lesson—*the How*—should be indicated in another column.

The matter should be expressed in as few words as is consistent with clearness; and the method should indicate the exact mode of working out the lesson; in a word, the method should show what facts are to be told, what ideas are to be developed, and how, that is whether by observation, experiment, or deduction.

Violations of this rule.—The following examples of sketches written by students in training are given as illustrations of the violation of this and other rules.

EXAMPLE 1. Given in the exact form in which it was written.

NOTES OF AN OBJECT LESSON ON THE HEDGEHOG.

AGE OF CHILDREN, 8 TO 10 YEARS. TIME ALLOWED, 30 MINUTES.

Points.	Matter.	Method.
		Make the children tell what animals they know that live in the woods and hedges. If they name the Hedgehog, seize upon it; if not, lead them to do so if possible by a slow general description of one. If they are quite ignorant, reserve the name till later and proceed.
THE ANIMAL —Shape, Size, &c.	Likeness to and difference from a little pig. Pointed nose, short legs, strong claws, and spines.	If any of the children have seen Hedgehog make them describe (probably they will think it is all sharp spines). Draw from their description, then add the needful to it, and make them notice the points.
HABITS.	Lives in woods and hedges—kind of nest—hybernation—rolling itself into a ball.	Where does Hedgehog live? How make nest? What does it need for this? (Nose and claws.) Elicit from children what animals do in winter—swallows fly away, rabbits have warmer fur, hedgehog goes to sleep. Other animals that sleep.
FOOD.	Insects, small reptiles or vegetables if very hungry, eggs, young birds, &c.	Let children think what food Hedgehog *could* get. Tell them what it likes best and what it will eat if pressed. Ask why Hedgehogs are useful in London kitchens, &c. Old fable of Hedgehog sucking cows.
YOUNG.	When produced —number—appearance.	Ask them when most young animals come—young birds, young lambs. Hedgehogs are born in early summer. Two or four at once. Quite blind like kittens; white, soft at first.

Points.	Matter.	Method.
POWER OF DEFENCE.	Spines and muscle for contraction.	Ask children what a hare, rabbit, or fox can do to escape enemies. Hedgehog can do none of these things. Has a good way of escape. Elicit from children. Here turn out the live Hedgehog, and when the children have examined him let them watch him during rest of lesson.
	Miscellaneous facts.	Tell story about Hedgehog, illustrating something which has been said. Tell any curious thing about one.
RECAPITULATE.	Appearance, habits, food, young, defence.	Question children in order, and write their correct answers briefly on the black-board, arranging the facts to form an exercise for them to copy on slate or in book.

It will be seen on examination that this sketch is defective in many parts. In the first place the points or heads are not well chosen, the matter not properly expressed, and a good deal of what is called method is in fact matter.

EXAMPLE 2. Given in the exact form in which it was written.

NOTES OF OBJECT LESSON ON COTTON.

AGE OF CHILDREN, 6 TO 8. TIME ALLOWED, 30 MINUTES.

Points.	Matter.	Method.
COTTON.	Cotton grows as a plant.	Question and draw a diagram of cotton plant showing pod.
COTTON POD.	Cotton gathered from pod by the hands, packed into bags, and sent to some other people, who mix it.	Ask children how and when fruit is gathered. Tell cotton is picked in the same way. Question so as to lead children on to tell it is so packed and sent away.

Points.	Matter.	Method.
COTTON WOOL.	It is divided again and laid on a kind of table, when it is beaten down and made soft; it is now called *cotton wool.*	Ask what they have seen soft and white; in this way lead to the desired answer.
COTTON THREADS.	The cotton wool is pulled out so fine that it is made into long cotton threads, to make it stronger it is twisted.	Show cotton threads, and ask how they think they are made; let the children try and do the same with their cotton wool.
CALICO.	These threads are made to cross each other, and made so strong; it is called *calico.*	Ask if they ever do anything in the Kindergarten, in which they use a needle, and go over and under. Show Kindergarten mat for mat plaiting, and tell that the cotton threads are worked in the same way.
SEWING COTTON.	One or two of the cotton threads that are made out of the cotton wool are twisted together and made strong; this makes the cotton we sew with.	Give children some cotton threads and allow them to twist them, showing they become stronger; then show reels of cotton.
		Question on all that has been said.

This sketch is very defective. In the first place, the heads are badly chosen, (see Fifth Rule, p. 14); in the second place, the matter is not entirely correct, and the way in which it is expressed is bad. In the third place, the method is both deficient and vague.

Eighth Rule. *Determine in your own mind the particular method to be pursued at the lesson,* and let this be stated fully and clearly. In order that the students may learn to do this they must study the nature of method in relation to teaching. This will be discussed in the next chapter.

Chapter III.—METHOD IN RELATION TO TEACHING.

The Nature of Method.—Method in its primary sense means the way by which certain results are attained, a plan or artifice for accomplishing some object. Applied to teaching it means the way by which the children's minds are led to the *perception* and *reception* of the truths contained in the lesson, and the various steps by which the results are achieved. As the *matter* of the lesson answers the question, *What is to be taught?* so the *method* which is to be followed answers the question, *How is the truth to be taught?*

It will thus be seen that method has to do with the treatment of the subject-matter of a lesson, and not with plans of dealing with children. Nor is it the same as the *instruments* which may be used in working out a lesson.

While there are many plans of dealing with children, and many instruments by which teachers may perform their work, there are but two methods of dealing with any subject. What these two methods are will be best shown by examples.

Examples of Methods.—*A lesson in Grammar.* Say a part of speech—the Noun. In working out this subject teachers have the choice of two methods. They may commence by giving the children a definition of a noun, and then proceed to illustrate it by a number of examples. Or they may commence by writing on the slate a number of examples, have these examined, and so lead the children to discover the office of the words, namely, to name the objects—cat, dog, house, city, &c., and so lead them to discover for themselves that there are certain words whose work is *to name.*

This idea having been developed, the name of the class would next be given, and after further examples supplied by the children, a definition would be worked out from the children themselves: "*A noun is the name of anything.*"

In the first case the starting-point was the general and abstract, and from this the children were conducted to the examples or the concrete. In the second case the process was the very reverse, namely, from the examination of the examples—the concrete, the children were led to the principle—the abstract. By the first method the name was first given, and then the idea was developed; by the second method the idea was first developed, and then the name was supplied.

Again, suppose the lesson to be *on a rule of Syntax.* Here the same choice of methods is open to teachers; they may commence the lesson by stating the rule, and then proceed to illustrate it by examples; or they may start by writing on the black-board a number of sentences, and by an examination of these lead the children to deduce the rule.

In teaching new rules of *Arithmetic* the same choice of methods presents itself. Suppose for instance that a lesson has to be given on "Proportion," and the particular point to be "The product of the means equals the product of the extremes," teachers may either commence by stating the rule, and then proceed to illustrate the fact by a number of examples; or they may obtain from the children a number of examples of equal ratios, and proceed to multiply each pair of extremes, and then do the same with each pair of means, calling attention to the result in each case. A number of examples having been worked, and the fact having been noted that the product in each case is the same, the children would be told that what they have observed respecting the examples on the black-board would be found to be the same in any

number of examples, and this has been expressed in the form of a rule. What is this rule? "When a proportion is formed the product obtained by multiplying together the first and last members of the series—'the extremes'—is the same as when the second and third members—'the means'—are multiplied together." Tell children that it is usual to express the rule thus, "*The product of the means equals the product of the extremes.*"

Again, in teaching *Geography* either of the foregoing methods may be used. Suppose, for instance, a lesson to be given on the river system of England, teachers may commence by telling the children that England is a well-watered country, that most of the towns are either on or in close proximity to a navigable river, and that most of the important rivers have an easterly course. Having told these facts, they might proceed to prove them. Or they might commence by requiring the children to examine a physical map of England, and so lead them to discover, 1st, that England has many rivers; 2d, that the rivers flow in several directions, but principally to the east, and this because of the direction of the mountains. By this means the children would be led to conclude, 1st, that England is a well-watered country; 2d, that by the rivers all parts of the country can be penetrated; and 3d, that the general course of the rivers is determined by the direction of the mountains.

Definition of the two methods.—Respecting the two methods indicated above, it may be remarked that the latter is the natural method of acquiring knowledge. In it the teacher proceeds from the parts to the whole; from the particular to the general; from the example to the principle. This method, which is the one best fitted for the instruction of children, is called *the Synthetic;* the former of the two methods, in which the teacher proceeds from the whole to the parts, from the general to the

particular, from the principles to the examples, is called *the Analytic.* This is the method of "book knowledge," and is best fitted for elder children and adults.

It will be evident to the thoughtful student that both methods are right and necessary in their own place. The observation of particulars is useless unless it is used to establish a general principle. On the other hand the mere enumeration of principles must always be unsatisfactory unless founded on previous observation.

To summarize this part of the subject:—*First,* When teaching young children always use the synthetic method. *Second,* Whatever method is used, always arrange the matter in such a way that the instruction shall proceed from what the pupil knows of the subject to what he does not know. From the known to the unknown. *Third,* Always commence with what is simple and go on to the more complex. A careful consideration of these points will prevent much loss of time and save the teacher much disappointment.

The Advantages of Method.—A few sketches of lessons constructed on the synthetic method are appended. (See page 56.) In relation to the teacher method has four advantages: *First,* It lays down the rules for the selection of matter and its arrangement. *Second,* It supposes a specific object present in the teacher's mind, which kept in view secures unity of purpose. It also implies that the leading ideas are progressively and naturally developed. *Third,* It insures the children being led by such paths that what is discoverable by them is so obtained. *Fourth,* It furnishes the teacher with the knowledge to choose the proper instruments with which to work out the lesson.

CHAPTER IV.—THE TEACHER'S INSTRUMENTS.

THE NECESSITY FOR INSTRUMENTS.—When an artizan —say a carpenter—receives an order to execute a certain piece of work, he first draws his plans, next secures his materials, and then selects the tools which are best fitted to the work which has to be done. He has to consider, first, what class of tool he will require, whether plane, chisel, or saw; second, what particular kind of each tool will be required to accomplish the work in hand. For instance, the plane which would be the best to use for smoothing the top of a table would not be fitted to make the bevelled rim of a writing-desk; nor would the chisel that is best fitted to cut the top of a leg of a chair be at all adapted to cut out the mortise of a mortise-and-tenon joint.

In like manner, teachers having determined in their minds what they are going to teach, and having settled upon their general method, must next consider what instruments are required to work out the lesson. To put it in another way, teachers must go to their tool-chest and take out the proper tool.

What then are the teacher's tools? They are **Interrogation; Illustration; Exposition; Explanation; Description.** In order that these instruments may be used at the proper time and in the proper manner, teachers must understand the nature of each, and by use acquire skill in handling them; the former they can do by study, the latter only by practice in teaching.

INTERROGATION.

I. ITS NATURE AND EDUCATIONAL VALUE.—Of all the instruments at the disposal of a teacher there is none of greater value than *interrogation;* at the same time there

is none more difficult to use rightly, and none more unskilfully used by young teachers.

The proper work of questions is to call forth thought on the part of those to whom they are addressed, hence they are educative. An example will make this clear.

Let it be premised that the readers of this chapter are sitting in a room engaged in some mechanical work; the tutor enters the room and asks the following question: "By what means was the air made available in the transmission of parcels by the Pneumatic Dispatch Company?"

It will be readily seen that the members of the class will at once arrange themselves into three groups. 1st, Those who have previously made themselves acquainted with the subject—those who are acquainted with the principles of pneumatics and have seen the application of these to the transmission of parcels as was actually done a few years ago at the North-Western District Post Office, London. 2d, Those who have studied the principles of pneumatics, but who have not heard of the "Pneumatic Dispatch Company," and who therefore have not made themselves acquainted with the application of the principles in this particular. 3d, Those who have never studied pneumatics and never heard of the company in question.

It will be interesting to trace the effect of the question on the minds of each of these classes. Those in the first group will endeavour to recall the facts which they have previously learnt; they will then arrange the facts in their proper order, and so by the exercise of memory answer the question. Those in the second group will by an effort of memory recall the principles of pneumatics, and then by the exercise of judgment and reason apply the principles and work out the answer. Those in the third group, being unacquainted with the subject, will confess their inability to answer the question; at the same time their

curiosity will be aroused, and this may lead them to make inquiries respecting the subject, so that they may at some future time be able to answer the question.

Thus then in each case a beneficial effect has been produced. In the first and second a direct effort of the mind has been called forth; memory in the first, and both memory and judgment in the second; while in the third, curiosity, or the love of knowledge, has been excited. In a word, the question acted as a *mental lever to raise thought*, and this is indeed the proper work of interrogation.

Not only do questions stimulate the mind to action, they also enable the teacher to fix the mind of the scholar on some particular subject of thought and so prevent wandering. An example will make this clear.

Suppose a number of individuals sitting in a room—say in a house in Greenwich—and having no definite subject of thought other than what is required to accomplish whatever may be in hand. A mutual friend enters, and having made the statement that it had been proposed to construct a railway tunnel through Greenwich Park, asks the following question: Suppose the tunnel to be finished, and several heavily-laden goods trains to pass in rapid succession, what will be the physical effects of these on the land in the immediate neighbourhood?

"Cause it to vibrate."

Right. A pause ensues, during which each person's mind relapses to its former condition. Another question is put: Suppose the vibrations of the land to extend to the foundations of the Royal Observatory—what will be the effect of this on the walls of the Observatory?

"Cause them to vibrate."

Right. Another pause ensues, and again the mind of each individual reverts to its ordinary occupation. Another question is put: Supposing the walls to vibrate,

and that some portion of the astronomical instruments used are set in the walls, what will be the effect of this?

"They will vibrate also."

Right. Another pause, then another question: If one of the instruments set in the walls be a telescope, what will be the effect of the vibration on this?

"Cause it to vibrate."

Right. Another pause, then another question: Supposing an observer to be using the telescope for the purpose of making observations on the satellites of Jupiter. When the train passes what will the planet appear to do?

"Move."

Right. Another pause. A subdued conversation. Another question: If the planet appears to move, and the observer is taking note as to the time of the disappearance of one of the satellites at that moment, what will be the consequence of the apparent movement of the planet?

"A wrong calculation will be made."

Another pause, a little more conversation, then another question: If the observer makes a wrong calculation and records it, what effect will this have on some future calculation based on it?

"Cause it to be wrong also."

Just so. Another pause, another chat, then another question: To what cause, therefore, may some future wrong astronomical calculation be attributed?

"To the passing of a heavily laden luggage train on the Greenwich and Woolwich Railway." Right.

It will be seen by the above examples that the interrogator possessed the power to control the thoughts of the members of the class and direct them in a particular channel at his will.

II. The Various Times at which Questions have to be put.

Parts of a Lesson.—Every properly constructed lesson consists of three distinct parts—the beginning or introduction; the middle or the lesson proper; and the end or summary. The work to be done in each of these parts is different, and so the instrument used to do the work must also be different.

1. *Introduction.*—At the commencement of the lesson the object of the questioning is either to introduce the subject, or to ascertain what the children already know of the matter in hand; or to ascertain how much the children remember of some previous lesson given on the same subject.

2. *The Lesson Proper.*—During the progress of the lesson, the object of questioning is to draw out the powers of the mind—*i.e.* to educate; to make the children sensible of their own wants; to make faint impressions strong, and to perfect half-formed and crude ideas.

3. *Summary.*—At the close of the lesson, the object of questioning is either to ascertain the amount of attention which has been paid—how many of the ideas worked out have really been received; or to lead the children to apply the subject to themselves.

Now, as the object in view at each part of the lesson is different, it is clear that the questions put at each part must be of such a nature as will accomplish the ends in view. And what are these?

1. *Questions at the commencement of the Lesson.*—If the object be to ascertain the extent of the children's knowledge of the subject of the lesson, then the question must be such as will allow the point required to be included in the answer; or what is called a *general* ques-

tion. A few of these put rapidly will enable the teacher to get from the class all they know of the subject.

An example will make the point clear. Suppose the lesson to be on "The adaptation of the elephant's trunk to the wants of the animal," the teacher might question thus:—

(1) In what countries do elephants live?
(2) On what do they feed?
(3) Where are such things found?
(4) What other animals feed on the same kind of substances?
(5) How do horses and cows reach their food?
(6) Why can they put their mouths to the ground?
(7) What kind of a neck has the elephant?
(8) What will this prevent the animal from doing?

So then the creature must have some other means of getting its food. What this is you will now be taught.

2. *Questions during the progress of the Lesson proper.*—The object in view here is to develop ideas, and so the questions must be what are called inferential or Socratic, and which enable the scholars to discover truth for themselves, and this by calling forth an effort of the mind, an effort of observation, comparison, judgment, or reason.

These teaching questions, when properly constructed, will be found to be arranged in logical order, each answer being made the basis of the next question. In this way the pupils are led along by a succession of steps to the desired goal; the means of reaching the goal are placed at their disposal, but it can be reached only by exercise.

3. *Questions at the close of the Lesson.*—The object of questioning here is two-fold: First, to ascertain what the children have received of the lesson given; and second, to lead them to apply the subject to themselves. In the former case the questions must be of a general character,

definite yet comprehensive. In the latter they must partake somewhat of the nature of teaching questions. In actual teaching, however, the applications in moral and religious subjects should be made during the progress of the lesson whenever that is possible.

III. RULES FOR THE FORMATION OF QUESTIONS.—Few things mark the skill of a workman more than the way in which he uses his tools, and similarly few things mark the character of teachers more than the way in which they question. When teachers really work out an idea by means of a chain of questions it is a proof that they have learnt one of the most important parts of their art. No such chain of questions, however, can be constructed without much thought on the part of the teacher, and a due regard to certain fundamental rules or principles which have their foundation in the nature of the child, and in the nature of the subject taught. As ignorance of these rules often leads to failures and disappointments, the most important will now be illustrated and formulated. Students must carefully study each rule, and endeavour to apply it when working out their lessons.

First Rule.—If a class of students were asked the following questions: What is the connection between mind and matter? and, Why has oxygen gas a greater affinity for some bodies than for others? they would have to confess their inability to give an answer. No alteration of the terms of the question, nor any amount of mental effort on the part of the students, would enable them to give a satisfactory answer.

Let us now pass from a class of students to a class of young children, and suppose them having a lesson on the "Qualities of *Iron.*" In the course of this the teacher asks: Why is iron not as heavy as gold? and, Why is cast iron brittle and wrought iron tough? Of course no intelligent answer could be given to either of these questions, and

the failure to answer might perhaps disappoint the teacher. The fault, however, would not be in the children, but in the questions; they are beyond the capacity of those to whom they are addressed. The first thing, then, which teachers should consider when preparing questions is the mental power of the children. They should bear in mind that the younger the child the more limited is the capacity. The questions put should present to the mind just as much work as will call forth its energies without overpowering it, whilst at the same time they make the child feel that by putting forth some energy he will be able to perform the work which has been given him to do. From all this it follows that the first rule to be remembered is, *Questions should be suited to the capacity of the children.*

Second Rule.—Suppose the following questions to be put to a class of students who had met to receive their first lesson on "Astronomy:" What are the arguments in favour of the nebulæ hypothesis? What are the constituents of the fixed star Arcturus? It is evident that, as the persons to whom these questions were supposed to be put had never given any attention to the subject, they would not be able to answer them; not, however, from any want of mental capacity, for the former has been clearly stated and can be learnt, and the latter can be discovered by the use of the spectroscope. The inability to answer is the result of *a want of knowledge.* Had the questions been put to those fully acquainted with the subject they would have answered them by an effort of memory. The same result would follow if a teacher, when giving a lesson on "Wrought Iron," commenced by asking, How is cast iron turned into wrought iron?

It is clear, then, that the second thing which teachers must do when framing questions is, to take care that they do not assume too much knowledge of the subject on the

part of the children; and hence the rule, *Questions should be suited to the children's information.*

Third Rule.—Teachers are often disappointed and discouraged because the answers given to their questions are not those which they want. The following examples of this occurred in the course of a lesson on the "Parks of London." The teacher, who wanted the children to say that they liked to walk on the grass in the parks, asked, "Where do you like to walk?" In reply to this the children said, "Down Regent Street, teacher." This not being the answer wanted, she replied, "Yes; but in what other place do you like to walk?" To which the children answered, "In a garden, teacher." This being as far as the previous answer from what she wanted, she said, "Yes, perhaps you do, but I did not mean that," and then she suggested the answer which she wanted. The mistake which this teacher made arose from the fact that she had not made up her mind what kind of question was likely to obtain the answer she required. Teachers should always bear in mind that while to the child the question must of necessity come before the answer, it should be just the reverse in their case; to them the answer should be the first thing considered, and then what question will obtain that answer must next be determined. Hence the third rule for the construction of questions is: *First make up your mind what answer is to be given by the children, and then so word the question that it may obtain the required answer. In other words, let the questions be direct,* and not ambiguous or admitting of a variety of answers.

Fourth Rule.—It has been shown that the proper use of questions is to act as educational levers to raise thought. If the following questions—which were really put by students in training—are judged by this standard they will be found most defective.

In a lesson on "Chalk" a teacher proceeded thus: "Chalk is a natural body, isn't it?" "It is white and hard, isn't it?" Another teacher, while giving a lesson on the "Rivers of England," and wishing to work out the uses of rivers, said, "One use of rivers, then, is to enable people to get to all parts of a country, isn't it?" A student, while giving a lesson on a "Horse," said, "You can all breathe by your nostrils, can't you?" "Don't you think the horse is very useful?"

It will be seen that in each of the above cases the teacher suggested to the children what answer they were to give. As *teaching* questions all such as these are most defective, and should be avoided. Hence the fourth rule is, *Do not let the questions suggest their own answers.*

Fifth Rule.—A student, when giving a lesson on the "Chimpanzee," said, "Do you notice anything about the head?" "Will the arms be useful to the creature?" "Is the hair on the skin long?" Another student, when giving a lesson on the "Fox," put the following questions: "Is the fox useful?" "Is the tail of the fox like that of a dog?" "Has the fox a small mouth?"

It will be evident to the thoughtful student that in more than one of the above examples the child would be uncertain as to whether the answer required was Yes or No, and so his chance of being wrong would be equal to that of being right. Should he be wrong, then the other children would be unjustly profited by his mistake; should he be right, then an end would be put to all further mental effort on the part of the other children. In either case a wrong would be done. Teachers should never lose sight of the fact that the utterance of a mere negative or affirmative has no necessary connection with true mental exercise. The fifth rule therefore is, *Avoid as much as possible those questions which can be answered by a simple "Yes" or "No":—what are commonly called Leading*

Questions. If ever such questions are put, they should immediately be followed by others demanding the reason for saying yes or no.

Sixth Rule.—A teacher while giving a lesson on "Africa," and wishing to find out whether the children knew the position of the Sahara, asked, "What is there in the north of Africa?" Another teacher while giving a lesson on the "Norman Conquest," and wishing to find out what other invasions had taken place, asked, "What took place before the Battle of Hastings?"

As might have been expected several answers were given to these questions, but not the one which the teachers wanted. The fault, however, was not in the children but in the questions; they were too wide, admitting of several answers, and yet not necessarily the one required. Hence the sixth rule is, *Let the question be definite, admitting of but one answer, or if more than one, each such as can be used with profit.*

Seventh Rule.—In the course of a lesson on the "Comparison of a Fox and a Dog," a teacher put the following questions: "What is the dog's nose?" "What else is very like the dog's?" "What is the pupil of your eye?" Another teacher, in the course of a lesson on the "Horse," asked, "What do you call the horse's foot?" "What kind of a horse do you think this is?"

No answer was given to any of the questions, because the children were unable to determine in their own minds what was the thing aimed at. The fault of the questions is their vagueness. Hence the seventh rule is, *Avoid vague, indefinite questions.*

Eighth Rule.—At page 27, under the heading of "the educational value of questions," a set is given which fairly represents the character of true teaching questions. If those examples are examined it will be found that each

question is based on the previous answer—the required answer being present in the teacher's mind before the question is put to the children. As this should always be the case the eighth rule is, *Let the teaching questions follow each other in a proper sequence, and keep the expected answer in your mind before you frame the question.*

Students must bear in mind the fact that such catechetical teaching does not preclude the use of illustrations, or of any other instrument. In order to show the value of chains of questions we append two examples, one on a secular subject, the other on a scriptural.

Example First.—Suppose, then, the question be asked, "How was the air made the means of transmitting parcels by the Pneumatic Dispatch Company?" No answer being given, we will suppose the terms of the question altered, and so: "On what principle was the pneumatic trough used by the Dispatch Company constructed?"

Suppose this question not to be answered, three courses would be open to the teacher: First, to tell; second, to suggest the answer; third, to work out the answer by a chain of questions. In the latter case the teacher would have to proceed in the following way. Addressing one member of the class he would say:

1. "Bring me a handful of air."

Supposing the person to try to do so, he would have to confess his inability to accomplish this task. The teacher would then ask:

2. "Why cannot you take a handful of air out of the room?"

"Because as I endeavoured to grasp it, it flowed away."

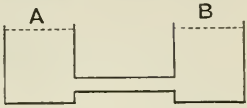
3. "What do you call those substances that flow?"

"Fluids."

4. "What then can you say of air because it flows?"

"It is a fluid."

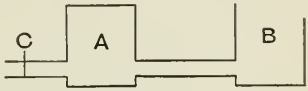
5. "Observe these two vessels, A and B; they are united by a pipe, and are filled with water. I will take some of the water out of the vessel A. What do you observe?"



"The water in B flows into A to take the place of what was taken out."

6. "Why does the water in B pass into A?"
"Because it is a fluid."

7. "Suppose both vessels to be filled with air instead of water, and A to be entirely closed at the top and to have an outlet at C. Now suppose some of the air in A to be drawn out at C. What will the air in B do?"



"Flow into A to take the place of that which has been drawn out."

8. "Observe this glass of water. I will place a piece of thin paper on the top of the glass and turn it upside down. What do you observe?"

"The water does not fall out."

9. "But as the water is much heavier than the paper, what might we expect it to do?"

"Press the paper down and fall out."

10. "But it does not do so. Let us see why it does not. Look carefully at the paper. What do you observe?"
"It is pressed upwards."

11. "What is next to the paper on the under side?"
"The air."

12. "What then does the air really do?"

"Overcome the weight or pressure of the water."

13. "What then does this prove the air to have?"

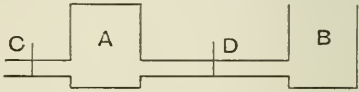
"Pressure, and greater pressure than the water."

14. "In this case what is the direction of the pressure of the air?"

"Upwards."

Tell the fact that the pressure of the air is equal to 15 lbs. per square inch of surface, and is the same in all directions.

15. "Keeping the above fact in mind, suppose the connection between vessel A and vessel B to be cut off by a



valve at D, and the air in A to be drawn out at C, what will be the condition of vessel A?"

"Empty."

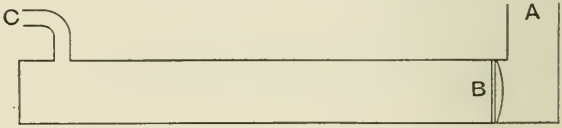
16. "Now suppose the valve at D to be opened, what will the air in vessel B do?"

"Flow into A."

17. "In what manner will it flow in?"

"With a force."

18. "Now suppose a long tube so constructed that the



air can be drawn from it at C, and that the tube be furnished with a movable disc of metal and placed at B.

When the air between C and B is drawn out of the tube what will the air in A do?"

"Press against the disc."

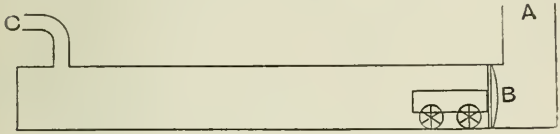
19. "With what amount of pressure?"

"Fifteen pounds to the square inch."

20. "Where will the disc be carried to?"

"To the end of the tube."

21. "If a small carriage be placed against the disc on



the inner side, and the air be drawn out of the tube at C, when the air rushes in the tube from A what will it do?"

"Force the disc and the carriage along."

22. "Where will they be carried to?"

"To the end of the tube."

23. "If the carriage were filled with parcels, where would they be driven?"

"To the end of the tube."

24. "How then can the air be made available for the transmission of parcels?"

"By constructing a tube with a movable disc, and attaching to the disc a wagon. The air in the tube then to be withdrawn, when the air from without rushing in to take its place forces the disc with its carriage through the tube, and thus the parcels are conveyed from one place to another."

Tell the fact that this is exactly what was done in the case of the Pneumatic Dispatch Company.[1]

[1] The author was himself carried along the tube in one of the wagons.

The student will observe that in the foregoing example nothing is told which can be found out by the exercise of the mind, and that what is told is made the means of mental exercise.

It is in this way that all physical ideas should be developed.

Example Second.—The next example is taken from the range of Scripture instruction, and will show how the application of a lesson may be made by the children themselves instead of being told by the teacher, as is mostly the case.

The lesson is supposed to be on the early life of Moses, and the point, or leading idea, to be "God's overruling Providence manifested for the good of his people." The children being in possession of the facts of the history, the teacher would proceed thus:—

1. "When the mother of Moses heard of the command of Pharaoh what did she do?"

"Hid the child."

2. "When she could not hide the child any longer at home what did she do?"

"Made a vessel of bulrushes and put the child in it."

3. "Where did the mother place the vessel?"

"By the side of the river Nile."

4. "At what particular spot?"

"Near the bathing-place of the women."

5. "What means did she employ to make herself acquainted with the condition of the child?"

"Set the sister to watch."

6. "Who came to the spot where the child was placed?"

"Pharaoh's daughter."

7. "What conclusion did she come to respecting the parentage of the child?"

"That the parents were Israelites."

8. "Considering the king's command respecting such children what ought she to have done?"
"Caused the child to be put to death."

9. "What called forth her compassion?"
"The weeping of the child."

10. "What did she desire to obtain for the child?"
"A nurse."

11. "Who came to her just at that time?"
"The child's sister."

12. "When asked to find a nurse whom did she bring?"
"The mother of the child."

13. "Who then became Moses' nurse?"
"His mother."

14. "In what way did the conduct of the mother prove a benefit to the child?"

Should this question not be answered, as is most probable, the teacher would have to break it up thus: (1) "What would the mother do for her child?" "Take care of him. Teach him. Train him." (2) "What might we expect her to teach him in addition to what he would learn as the son of Pharaoh's daughter?" "Something about the God of his own people." (3) "What special benefit, then, would the child receive?" "He would gain the knowledge of the true God as well as the learning of Egypt."

15. Now repeat question 14—"In what way did the conduct of the mother prove a benefit to the child?"
"In giving him the knowledge of the true God."

16. "What led Moses' mother to act as she did?"
"She loved her child."
"Yes, but there was another reason: read Heb. xi. 23."

17. "What was it, then, that really led her to act as she did?"

"She had faith in God."

18. "Considering the nature of the king's command, what might have been expected to follow?"

"Evil, suffering, death."

19. "What did come to Moses through the king's command?"

"Good."

20. "Who was it that caused the good to come out of the evil?"

"God."

21. "What then can we say in this particular that God did?"

"He brought good out of evil for the happiness of His servant."

The student will observe here again that nothing has been told which could be found out; and that the application has been made by the children themselves, not by the teacher. It is in this way that all moral ideas should be developed, and applications made.

IV. The Manner of putting Questions and dealing with Answers.

First. *The manner of putting questions* should be carefully studied.

1. Questions should follow each other in proper order of time; neither too fast nor too slow. When questions are put too rapidly the children have not time to think out the answers, and so they may get discouraged. But, on the other hand, if questions are put very slowly the attention of the children will flag, and there will be a want of interest.

2. Questions should be addressed to the whole class,

and the individual who is to reply should be indicated by the teacher. It is a grave educational error to put all the questions to a few bright children. It is the duty of teachers to endeavour to arouse the dull, and to arrest the attention of the careless, and both these can be done by means of vigorous questioning.

3. During the progress of the lesson—that is while any ideas are being developed—answers should be taken from individual children. Simultaneous answering should only be permitted *after* the proper answer has been obtained, so that the whole class may be instructed. Simultaneous answering may also be allowed during the recapitulation of a lesson.

4. The practice which some teachers have of breaking off in the middle of a question to make a statement, or to alter the terms of the question, is to be deprecated. The effect of such a practice is to stop all mental effort on the part of the children.

5. It is a bad practice for teachers to end their questions with "What," yet this is often done. Not many months ago we heard a student, when giving a lesson on "India-rubber," address her class thus: "This is a piece of what?" Another while giving a lesson on "Geography" said: "England is a part of what?" All such expressions should be avoided.

6. While working out ideas, and in teaching elder children, questions should not be put in an elliptical form. We have heard many ludicrous answers given by children in response to the teacher's ellipsis. In one case when a teacher was giving a lesson on "Form," and wishing to get from the children that the particular shape represented was a circle, she swung her arm round and said, "This is a—" "Wheel," answered the class. "No! no!" replied the teacher; "think again, children," and then repeating

the action said, "This is a—" "Hoop." "No! no! children, I don't mean that." Failing to obtain the correct answer, the teacher prompted her class, and said as she swung her arm round, "This is a cir--" "kle," shouted a sharp little boy.

On another occasion a teacher was giving a lesson on the early life of Moses, and wishing to bring out the fact that Pharaoh's daughter went to the river Nile, said, "Pharaoh's daughter went to—" "Bed," cried out a merry-faced little girl. Of course the teacher was somewhat confused by this unexpected statement, and reproved the child for making it. She should, however, have blamed herself. The proper use of the ellipse is in the recapitulation of a former lesson, and in making summaries. When used at these times it is a valuable aid in securing the interested attention of the children, and is especially valuable when dealing with infants and younger children.

Second. *Dealing with answers.*—Considerable care and not a little skill are required in dealing with the answers given by the children.

1. It is a common practice with young teachers to reject all answers which differ from the one which they have made up their minds to get. This should not be done, because, though the answer given may not be just what was anticipated, it may contain the germ of the desired answer, and may be the result of much thought on the part of the child. When such answers are given the teacher's duty is to extract the truth from them, and so encourage the children to further effort. The truth so obtained should be made the property of the whole class. Here simultaneous answering may be allowed.

2. An answer may be entirely wrong, and yet be the result of thought. When such is the case the thought-

fulness which produced it should be acknowledged. But whenever a wrong answer is given it should be noticed, and the correction made at once. The corrected answer should be impressed on the children's minds by simultaneous answering.

3. When really good answers are given they should receive commendation; but the teacher should not get into the habit of saying to those who give them, "There's a *good child.*" Many really troublesome children often give very good answers, and to call them *good* is to confound the moral sentiment of the class. In all such cases it is better to say, "That is right," or "I am pleased with your answer." It is right to approve what is thoughtful. A judicious use of praise will serve as a wholesome stimulant to further effort.

CHAPTER V.—THE TEACHER'S INSTRUMENTS (*Continued*).

ILLUSTRATION.

I. ITS NATURE.—The true nature of *illustration* as an instrument of teaching will best be seen by considering the derivation of the word itself. The noun "illustration" comes from the transitive verb "illustrate," which is derived from the Latin *illustro*, to light up, to make clear. To illustrate, therefore, is to encircle with light. Applied to teaching it means to throw light upon something which is obscure, either in fact, in doctrine, or in duty; and the illustration, like a ray of light thrown upon a dark object, makes the obscure clear, converts the abstract into the applied, and the general into the particular, so that the mind is able to perceive the truth. What does not

accomplish this is not an illustration in the strict sense of the word.

II. Its Value.—As an instrument of teaching illustration is very important, and if rightly used is most effective. The subject, however, is often misunderstood by young teachers, hence it often happens that what are called illustrations are mere anecdotes, told for the purpose of sustaining the attention of the scholars. While it may be true that an anecdote may often be used with profit for the purpose of arousing interest, it must not be forgotten that in that case the anecdote is not an illustration in the strict sense of the word. Whatever is used to *throw light* upon some obscurity is an illustration, and nothing else is worthy the name. When the illustration has thrown light upon what was obscure it has done its work and should pass away. If this is not the case the mind will be occupied in contemplating the illustration and so lose sight altogether of the truth which was to be illustrated. The same result follows when an undue number of illustrations are poured into the mind. If one illustration is sufficient to make the matter clear, then no more should be used. An example will be useful here.

III. Examples:

1. A teacher was giving a lesson on the "Manufacture of Sugar," and having led the children to comprehend the processes up to the boiling of the juice, told them that in the boiling some portion of the juice forms into crystals, but some remains liquid. He then endeavoured to draw from the class how the liquid portion which will not crystallize could be got rid of without disturbing the whole. In this he failed, and so he threw a ray of light on the obscure point by reference to boiling peas in a saucepan of water. How can the water be got rid of? One child said, "By making some holes in the bottom of the sauce-

pan." "Yes," replied the teacher, "but then the saucepan would be spoiled. So another plan is adopted. What is that? Yes, they are strained off. Now let us apply this to the sugar. It cannot be strained off, so that plan will not do here." At this stage two children proposed to make some small holes in the bottom of the vessels in which the cooling liquor is put. The teacher then proceeded to describe the two methods employed—either drawing off the liquid portion, or placing the whole in hogsheads in the bottom of which are a number of small holes.

2. A lesson was being given on Romans v. 1, 2, "Therefore being justified by faith, we have peace with God through our Lord Jesus Christ; by whom also we have access by faith into this grace wherein we stand." The teacher wished to develop the idea of having "access" to God by Christ. He told the children that instead of the word "access" we may use the word "introduction," and read the passage thus: "By whom also we have an introduction." The children not having a clear idea of what it was to have an "introduction," the teacher illustrated it by reference to a person being presented to court. When the queen holds a "drawing-room" not every lady may present herself to her majesty although she may desire to do so. Any person who wishes to present herself at court must find some person who has the right of entry to the queen, and who, knowing the said person, is also willing to introduce her to court. The individual having expressed her willingness to take the other to court does so, and thus on the action of this other person the individual who had no right of her own to enter the presence of the queen does so, and is said to have been introduced to the queen or to court. From this time the person thus introduced will have the right and the privilege of attending all future "drawing-rooms." In like

manner Christ introduces the believer into the favour of God, and by virtue of Christ's action the sinner can go straight up to God, so to speak, and can and does rejoice in this privilege at all times.

It will be evident to the thoughtful student that there is no necessity to multiply examples here. The one illustration has thrown its ray of light on the obscurity and made the matter clear, so another would be superfluous. If, however, the idea to be developed be of a complex nature it may be necessary to use an illustration for each part. Still not more than one for each need be used.

It may sometimes be advisable at the close of the lesson to call for examples to test the children's knowledge, but such examples are not to be confounded with those used for the purpose of throwing light upon the subject which is obscure.

IV. Sources of Illustrations.—The sources of illustrations are the following:

1. *Similes*, that is simple comparisons between visible objects and moral and spiritual truths. Example: "I am withered as grass."

2. *Metaphors*, that is figures in which there is some resemblance between the two things to which a word is applied. Example: "He was a burning and a shining light."

3. *Personifications*, that is figures in which the qualities of a person are ascribed to inanimate things. Example: "Tremble thou earth at the presence of the Lord."

4. *Parables*, that is allegories written in the style of histories, in which the occurrences mentioned may have taken place, and while one thing is compared with another, one thing is never said to be another.

5. *Proverbs*, that is moral sentences, maxims, and aphorisms, such as those written by Solomon and those spoken by Christ, as for example: "If the blind lead the blind, both shall fall into the ditch."

6. *Anecdotes*, that is the narration of some real occurrence in the life of some person.

7. *Natural objects*, animal, vegetable, or mineral.

8. *Pictorial representations*, as of the manners, customs, and dwellings of foreign nations, &c.

V. RULES FOR THE USE OF ILLUSTRATIONS.

1. Never use an illustration for the mere sake of doing so, but only for the purpose of throwing light upon what is obscure.

2. Always keep the illustration subordinate to the truth to be enlightened. It is not the illustration which is to be remembered, but the truth or the duty.

3. When an anecdote is given, let it be a true one. If there is no evidence of its truth, and yet it is apposite, give it as a parable, or say at once that you do not know whether it be true or not.

4. Illustrations to be useful must be apposite. When illustrating the general by the particular be sure that the cases are related to each other as such; if the particular by the particular, be sure that there is an analogy.

5. Illustrations must be familiar: it is of no use to refer something unknown to another which is equally unknown.

6. Illustrations must be clear and graphic; that is, they must be handled in such a way that the essential points of resemblance may be distinctly brought out.

7. Teachers should cultivate the habit of recording in a note-book anything that may afterwards be used for illustrations.

CHAPTER VI.—THE TEACHER'S INSTRUMENTS (*Continued*).

The Forms of Telling.

There are some things which cannot be developed by questioning or by illustration, and these must be told. Telling, therefore, is one of a teacher's instruments. But there is an art in telling, and teachers should study that art. The forms which telling assumes may be considered as EXPOSITION, EXPLANATION, and DESCRIPTION.

EXPOSITION

I. ITS NATURE.—The word "exposition" comes from the Latin *expositio*, and means a laying open, a setting out to public view, a laying open the sense or meaning of anything. Applied to teaching, it means the effort on the part of a person who has an idea in his mind to give another person the same idea by means of language. This is a very common practice with young teachers, but from ignorance of the conditions of successful exposition their efforts fail, and instead of laying open to the mind the sense of what is spoken, they merely make use of a number of words which fail to convey any idea at all to the children.

II. THE CONDITIONS OF SUCCESS.—In order that an exposition may be effective it is necessary that:

1. The *ideas* which are clothed in language must be such as are within the child's capacity to receive.

2. The *language* in which the ideas are clothed is such as can be understood by the children.

3. Every part of the subject must be spread out before

the mind, and in such a way that the mind can really take it in.

III. An Example of the Violation of these Rules.—The importance of the above rules will be seen by the following exposition of the nature of the atoms of gas taken from the writings of a modern professor: "Now, there are certain particles or small masses of matter which we know to bang against one another according to certain laws, such, for example, as billiard balls. Now, the way in which different bodies, after hitting together, come apart again, depends on the constitution of those bodies. The earlier hypothesis about the constituents of a gas supposed that the particles of them came apart according to the same law that billiard balls do; but that hypothesis, although it was found to explain a great number of phenomena, did not explain them all. Professor Maxwell found that particles when they come together separate as if they repelled one another, or pushed one another away; and as if they did that much more strongly when close together than when further apart."

Now, notwithstanding the fact that the foregoing exposition is perfectly accurate and expressed in suitable language, only those will understand it who are acquainted with certain facts and opinions respecting physical science. Where that knowledge is not possessed the exposition, though accurate, is useless.

Teachers should bear in mind that in the case of children the difficulty of understanding an exposition is much greater than in the case of adults, because their ideas are fewer and their knowledge of language much more limited.

EXPLANATION.

I. Its Nature.—The noun "explanation" is derived from the Latin verb *explano*, which means to make even, plain, or manifest, to clear from obscurity. Applied to teaching "explanation" means the substitution of a word or phrase by which another is supposed to be made simpler.

II. Common Defects in Explanation.—It often happens that the substituted word or phrase is as difficult, or even more difficult, than the original. That this is so will be seen by the following examples taken from Reading Books.

Animal: a being with life, an organized body having life, sensation, and voluntary motion.

Crystal: a superior kind of glass; a piece of matter which has assumed a definite geometrical form with plane faces.

Metonymy: a change of name; a trope in which one word is put for another related to it, as the effect for the cause.

Portentous: ominous.

Bearing: mien.

Severity: inclemency.

It will be evident to every thoughtful teacher that each of the above explanations fails to make the matter plain to the mind. In some, indeed, the so-called explanation obscures rather than enlightens. Take for example *an animal*, "an organized body having sensation and voluntary motion;" or *a crystal*, as being "matter which has assumed a definite geometrical form with plane faces." These expressions are not likely to convey to a child any definite idea, and therefore are useless. The same may

be said of several if not the whole of the other explanations.

DESCRIPTION.

I. Its Nature.—The word "description" is derived from the Latin *describo*, to write down, to mark out. Description, therefore, is the act of delineating or giving an account of anything in words. Applied to teaching it is the act of picturing out, or of forming in the mind of a child *a word-picture*, which will serve the same purpose to the mental perception as a drawing on paper does to the physical sense of sight. There is a great charm in graphic descriptions, and those teachers who possess the power of making them have at their command a most valuable and powerful instrument for arousing attention and securing the interest of the children.

II. The Conditions of Success.—There are several conditions which must be observed in order that the description or word-picture may do its proper work; they are the following:—

1. The picture which teachers wish to draw must be well defined in their own mind. Hence the importance of an accurate and extensive observation of natural scenery, customs, manners, ceremonies, and the like. When teachers have not the opportunity of making personal observations of these things, then they should avail themselves of the observations of others as given in books of travel, &c.

A few years ago the writer was sitting on a bank at the end of one of the spurs of Highgate Hills, when he was accosted by a gentleman who had lately arrived in London. In the course of the conversation which ensued the stranger expressed his surprise to find the neighbourhood of London "so mountainous." In answer to some

questions it came out that he was a native of the Fen country, and that he had never before travelled so far from his native village. As he had never had the opportunity of observing any really hilly country, he was entirely ignorant of the nature of a mountain, and so was ready to ascribe to a mere hillock the dignified term of mountain. If this individual happened to be a Sunday-school teacher, and were required to give a lesson on "Moses at Sinai," it would be quite impossible for him to describe the scene, and so he would fail altogether to give the children any adequate idea of the physical aspect of that narrative.

2. The details of the picture must consist of things with which the children are familiar, otherwise no picture can be formed in their minds, and so no good can result from the description. In the case of children living in large cities, and who have little or no opportunity of observing nature, a drawing, a photograph, or an object will be more effective in giving them a proper idea of the matter than any word-picture however vividly it may be drawn.

3. The picture must not be over-weighted by words. In teaching the sciences it is found that a bold outline accurately drawn is much more effective than a highly finished picture. The former appeals to the eye at once, and the mind through the eye makes it its own. In the latter the eye has to traverse the entire subject, and finds it difficult to make a choice of any one detail out of the many which are portrayed. So in a word-picture, the many words—the colouring matter, so to speak—prevents the mind from grasping the central figure—the one important point in the picture.

4. While care must be taken not to overburden the picture with unnecessary words, it must be supplied with

all proper details. Children are fond of particulars, and these should be clearly drawn in the word-picture. Is it a field which is being drawn before the mind's eye? Then there must not only be the grass, but the daisies also; not only the trees, but the birds resting on the branches; not only the birds, but their kinds and their actions.

III. THE MATERIALS.—The materials for word-pictures are to be found in natural scenery, natural objects, natural phenomena, habits of animals, and the customs and habits of foreign nations.

Then again the Scripture narratives are full of rich material for the most vivid and attractive pictures. If some of the incidents of our Lord's life were graphically described at the lessons, the exhibition of power, the act of mercy, or the expression of indignation at evil would be indelibly stamped on the mind, and then if in after life the youths were brought into circumstances of a similar or dissimilar kind, the whole picture would be revived in the mind, and the lessons which were learned in school would find a second application.

Chapter VII.—PATTERN SKETCHES.

THE CONE.

Heads.	Matter.	Method
I. Recapitulation of former Lesson on Hemisphere.	"A hemisphere is a solid bounded by one curved and one plane face."	Place the solid before the class and require the children to describe it.
II. Idea of a Cone.	"A cone is a solid having one plane face called the *base*, and one curved face coming to a point, which point is called the *apex*."	Show a cone. Children to examine it; say how many faces it has—two; the kind of faces—one plane, one curved. Children next compare the new solid with the hemisphere, which also has two faces, and say how it differs. The curved face of the new solid comes to a point. Tell the children that the plane face is called the *base*, and the point at which the curved face terminates is called the *apex*. These facts to be repeated by the children.
III. Name and Definition.	As above.	Tell that the solid which they have just described is called a *cone*. What then can they say a cone is? Repeat the definition as in the matter.
IV. Examples.	A sugar loaf is a cone.	Let the children name any object which they may have seen of the same shape. If not known show a picture of one.

Students to construct a Sketch on the same plan on a Cube.

A RULE OF SPELLING.

Heads.	Matter.	Method.
I. RULE DEDUCED.	"Words of one syllable ending with one consonant preceded by one vowel, double the final consonant when a syllable is added which begins with a vowel."	1. Write the following words on the black-board: *dot, fag, glad, ship, knot, sin.* Children examine the words as to (*a*) length—all one syllable; (*b*) with what they all end—a consonant; (*c*) with what the final consonant is preceded—one vowel. 2. Adds a syllable to each word thus: dot-*ted*, fag-*ged*, glad-*den*, ship-*ped*, knot-*ted*, sin-*ned*. 3. Children examine the words again and say of how many syllables they consist—two, one syllable has been added; with what letter the new part begins—a vowel; and what letter precedes this vowel—the same as that with which the original word ends. 4. Give and get other examples, by which the children will see that the same change occurs. Tell them that this is always the case, and so is said to be *a rule in spelling.*
II. RULE EXPRESSED.	See matter above.	Question as to what they can say the rule is, and let the whole class repeat what is written in the matter.
III. EXERCISES.		1. Children repeat the rule from the black-board until known. 2. Children repeat the rule from memory. 3. Give short dictation exercises to test children's knowledge.

Students to construct Sketches on the same plan on other Rules.

CLASSIFICATION OF VERBS INTO TRANSITIVE, INTRANSITIVE, AND NEUTER.

Heads.	Matter.	Method.
1. IDEAS DEVELOPED — 1. TRANSITIVE AND INTRANSITIVE.	"Some verbs express actions which remain with the doer; others express actions which pass over to a receiver."	1. Write on the black-board a number of sentences containing verbs of both kinds mentioned in the matter; as, "The dog barks," "The boy struck the table," "The bird sings," "The girl scrubbed the floor," "The cat sleeps," "The horse kicked the boy." 2. Children to parse the sentences; verbs to be underlined. 3. Children to examine the verbs for the purpose of discovering their nature. Number those which are similar. In the sentences "The dog barks," "The cat sleeps," and "The bird sings," the verbs express actions which do not pass over to a receiver; while in the sentences "The boy struck the table," "The girl scrubbed the floor," and "The horse kicked the boy," the verbs express an action which does pass over to a receiver. 4. Teacher with the aid of the children arrange the verbs into two columns, writing over each their character.
2. NEUTER VERBS.	"Some verbs do not express action at all, but a state of being."	5. Write some sentences with parts of the verb "to be," as "John is hot," "I am thirsty," "They are good," "Many will be happy." 6. Children to examine the sentences. Point out the verbs and compare them with the other two sets, when they

Heads.	Matter.	Method.
		will see that they differ from both in not expressing any kind of action but a state of being. 7. Arrange the verbs by the side of the others, and write over them their character. 8. Question as to how many kinds of verbs they have discovered—three.
II. NAMES GIVEN AND DEFINITION WORKED OUT.	1. Those verbs which express that the action passes over to an object are called *Transitive* (passing over) verbs. 2. Those verbs which express that the action does not pass over to an object are called *Intransitive* (not passing over) verbs. 3. Those verbs which do not express "action" but "being" are called *Neuter* (neither) verbs.	Question the children on the character of each kind of verb. Tell them that each kind receives a name. Give the names. Lead the children to see their appropriateness, and help them to work out the definitions as written in the matter column. What then is a *transitive* verb? What then is an *intransitive* verb? What then is a *neuter* verb?
III. EXERCISES.		1. Give children sentences in which transitive or intransitive verbs occur, and require them to say which they are. 2. Children to give sentences in which there are neuter verbs. 3. To point out the kinds from a passage in book.

Students to construct a Sketch on the same plan on the classification of any other part of speech.

THE NOMINATIVE AND OBJECTIVE CASES OF NOUNS.

Heads.	Matter.	Method.
I. IDEAS DEVELOPED — OF CASE IN GENERAL.	"The condition or state of the nouns in a sentence is not always the same. "Sometimes the noun is the subject of the sentence—the name of the *doer* of an action. "Sometimes the noun is the object of the sentence — the name of the *receiver* of an action. "Sometimes one noun is placed in relation to another, as expressed by a *preposition.* "These different states of the noun are called the *case* of the noun."	1. Write on the black-board the following sentences: "Jane is there," "Jane sung a song," "Jane wrote on the slate," "The slate fell on Jane," "The slate is in the box." 2. Children to examine these sentences and name the noun in each. As named to be underlined by the teacher. 3. The nouns to be examined to find out their different offices. All those at the beginning of the sentences are the subject of the sentences; some of these are also the names of the doers of an action; some are the names of the receivers of the action expressed by the verbs and are the objects of the sentence; others are placed in some relation to another noun in the sentence, which relation is expressed by the preposition. As each point is worked out the noun to be underlined with a distinct mark to enable the children to see the difference, thus: —— for subject, — for object, ≈≈≈ for relation. Tell that these different states of the noun are called the "case of the noun."
II. NAMES GIVEN AND DEFINITION WORKED OUT.	Those nouns which are the subject of the sentence, or the names of the doers of the action, are said to be in the *nominative* case.	TO BE TOLD. At the end help the children to work out the definition of the cases as expressed in the matter.

Heads.	Matter.	Method.
	Those nouns which are the names of the receivers of the action expressed by the verbs, or are the objects of the sentence, are said to be in the *objective* case.	
III. EXERCISES.		1. Give sentences, and children point out the nouns which are in the nominative case, and say why they think so. 2. Do the same with the objective case. 3. Children to give sentences with a noun in either of the cases as asked for. 4. Children to point out nouns in either case out of a passage in Reading Book.

Students to construct a Sketch on the same plan on the Possessive Case.

A HEN'S EGG.

(YOUNG CHILDREN.) AIM—TO CULTIVATE ACCURATE OBSERVATION.

Heads.	Matter.	Method.
I. INTRODUCTION.	An egg is an animal substance. It is laid by a bird. It is oval, hard to the touch, and easily broken.	Tell the children the subject of the lesson. Show several eggs. Question as to how we obtain them, and let children describe one generally.
II. THE PARTS OF AN EGG.	The parts of an egg are: 1. The shell, which is lined with a very thin skin. 2. The white or glaire. 3. The yelk, which is covered with a very thin skin. 4. The balancers or treddles, which keep the yelk in its place.	Take a hard-boiled egg to pieces and so lead the children to discover its parts in the order in which they occur. To lead the children to discover the "balancers" carefully break an egg into a wine glass and draw attention to the delicate threads at either side of the yelk. Write substance on slate.

Heads.	Matter.	Method.
III. QUALITIES OF THE PARTS.	1. The shell of the egg is, *a* white, *b* thin, *c* smooth, *d* hard, *e* brittle, and *f* translucent. 2. The lining of the shell is, *a* white, *b* thin, *c* tough, and *d* semi-transparent. 3. The glaire in its raw state is, *a* colourless, *b* liquid, *c* sticky, and *d* insipid. When boiled it is *a* white, *b* solid, *c* tough, *d* opaque, and *e* insipid. 4. The yelk is, *a* round, *b* yellow, and *c* has a peculiar flavour. It is *d* liquid when raw or when slightly boiled; by much boiling it becomes *e* solid, and can be *f* crumbled.	1. Children discover *a* and *b* by sight, *c* and *d* by sense of touch, *e* by experiment of bending backwards and forwards, *f* by comparison with glass. 2. Each of these qualities to be brought out by same method as above. 3. Bring out *a* by comparing it with colour of shell; *b* by showing that it can be poured out; *c* by letting a child put a finger in the glaire, and then, touching another finger with the first, say what he notices; *d* by letting a child taste it and compare with some sapid material, and say what difference he observes. Now deal with the boiled egg, and work out *a*, *b*, *c*, and *d* by observation and *e* by comparison. 4. Bring out *a* and *b* by observation, *c* by comparison of raw and boiled egg. As each quality is developed write name on slate as in the "matter" column.
IV. THE USES OF EGGS.	1. In nature eggs produce young birds. 2. Those laid by the poultry birds and some of the water birds are used as food. 3. Eggs are prepared for food in several ways: Boiled in the shells and eaten with bread and butter; taken out of the shells and either boiled	1. Question as to this fact; if not known, tell. 2. Tell the first part, and children give names of birds whose eggs are eaten by man. 3. Question on what the children may have seen respecting these facts. Tell what is not known. As each fact is worked out write substance on the

Heads.	Matter.	Method.
	or fried; beaten up with milk or wine and eaten raw; mixed with flour for puddings and cakes, and also with milk for custards.	slate, as in the "matter" column.
V. SUMMARY.		At the end of the lesson the children to read what has been written on the slate; then question on the facts.

Students to construct another Sketch on some common object with several parts—say a Penknife.

THE CAT.

CHILDREN BETWEEN THE AGES OF 8 AND 10.

POINT—THE ADAPTATION OF STRUCTURE TO HABITS. The apparatus required those mentioned in the sketch.

Heads.	Matter.	Method.
I. INTRODUCTION.	The cat is a home-loving creature and is a favourite both with children and women. It is capable of evincing great affection for individuals.	Tell subject of lesson. Question children as to where they generally see dogs—running about the streets or following their masters or mistresses. Where they generally see cats—in houses, or in the gardens or fore-courts of houses. Tell instances of cats being fond of an individual (see page 212 of *Common Things*). Write substance on slate.
II. HABITS OF THE CAT.	1. The cat is fond of warmth; likes to lie in front of the fire or in the sunshine. 2. It can distinguish sounds with which it has associated pleasure or pain—the bark of a dog frightens it, the call of the cat's-meat man or	1. Brought out by questions on what children have observed their own cats do in this respect. 2. Question as to whether children have ever noticed these things. Impress on children the fact that it is cruel to set dogs running after cats.

Heads.	Matter.	Method.
	the clatter of plates will bring it out of its resting-place. It is more attached to places than to persons. 3. When a cat is in want it mews, when angry it growls, when pleased it purrs. It shows its pleasure by rubbing up against persons and things, and prowls round and round when expecting to be fed.	Tell of cats which when they have been carried to new home have returned to the old one. 3. Question the children on what they may know of these facts. Tell what is not known. As each set of facts are worked out write substance on the slate.
III. Food and Adaptation of Structure to obtain it.	1. Cats are naturally fond of raw flesh; they prefer mice and birds. To obtain these the creatures crouch on the ground to take an aim, leap upon the prey, seize it with their claws, and tear it in pieces with their teeth. 2. The structure of the cat is fitted to obtain the prey— (*a*) The sight is very acute; the creatures can see with a very small amount of light. (*b*) There are special organs of touch placed on either side of the mouth. (*c*) All the toes are padded, and as cats always walk on their toes they are silent walkers. (*d*) The teeth are fitted for seizing and cutting. The jaws cannot be moved from side to side; they act as a cutting machine. (*e*) The tongue is cov-	1. Question out what is known of this; tell the rest. (*a*) Draw diagrams of cat's eyes as at page 214 of *Common Things*, and thus lead children to see how pupil is enlarged when light is deficient. Make it clear that cats cannot see in the dark. (*b*) Get living cat. Point out these organs, and by touching the feelers children will see by the uneasiness of the creature how sensitive they are. (*c*) Contrast the walk of the dog with that of the cat. One can be heard the other cannot. Make diagrams of cat's foot and explain the structure, and work out the effect of pads.

Heads.	Matter.	Method.
	ered with small horny points which project backward, forming a kind of file with which the creatures rasp off the flesh from the bones.	(*d*) Show cat's jaw, or make a diagram, and illustrate the action, thus leading children to see that the jaws are *cutting* machines. (*e*) Refer to the lick of a cat; compare it with that of a dog. Show why the former tickles, and work out the use of such a rough surface. Write substance on slate as worked out.
IV. SUMMARY.		1. Children read what has been written on the slate. 2. Question on the various facts.

Students to construct a Sketch on the Dog.

THE DAISY.

AIM—TO ENCOURAGE CHILDREN TO TAKE PLEASURE IN FLOWERS.
AGE OF CHILDREN—6 YEARS.

Heads.	Matter.	Method.
I. INTRODUCTION.		Tell children the subject of the lesson. Show a complete daisy plant. Give name. Talk with children as to where they have seen it; of plants that grow in fields, others that they may have in pots at home, or have seen in the streets.
II. THE PARTS OF THE PLANT.	The daisy plant is small and pretty. It has a flower, a stalk,	Encourage the children to say what they know about the plant. Show

Heads.	Matter.	Method.
	several leaves, and a root.	some flowers wide open and others closed. Tell children that its name means "day's eye," because the flower opens when the daylight comes and shuts up at night. Compare with our shutting our eyes at night. Hold up a plant, and let the children name the parts as touched.
III. DESCRIPTION OF PARTS.	The flower is made up of a number of white leaves (sometimes these are tipped with crimson). This part is called the corolla. In the middle of these white leaves (or *corolla*) are a number of yellow stamens. All the coloured parts are held in a cup made up of five small green leaves: this part is called the flower-cup (or *calyx*). The whole flower is held up by a stalk which is green, round, smooth, and strong enough to hold up the flower. The leaves are green and rather thick: they are placed at the bottom of the flower-stalk. The root is made up of a number of thread-like pieces called fibres.	Give each child a complete plant. Draw attention to each part in order, and help the children to describe them as to—of what composed, where situated, and by what distinguished. Supply proper names when not known, and so work out the matter as on opposite column. As each fact is worked out write substance on the slate.
IV. THE GROWTH OF THE PLANT.	The daisy grows in fields and on banks, low down in the grass. It flowers for the greater part of the year. Some flowers peep out in very early spring.	Encourage the children to tell all they know about the plant. Tell what is not known. As each fact is worked out write substance on the slate.

Heads.	Matter.	Method.
	The flowers seem to like to look up at the sun, to open in the morning, and close in the evening and in cloudy and wet weather.	The children to take home their plants, and be asked to plant them in a small pot.

Conclude the lesson by singing the "Song of the Daisy."

Students to construct a Sketch on another common wild-flower—say the Buttercup.

ON BODIES FIBROUS AND FRIABLE.

For Children about 8 or 9 Years of Age.

Objects required.—A piece of the stem of flax-plant; some cotton, wool, and silk; a lump of chalk, and a piece of dry clay.

Heads.	Matter.	Method.
I. Fibrousness, *Idea and Name.*	The stem of flax is made up of a number of thread-like pieces. Each piece is called a fibre; because made up of fibres it is said to be *fibrous.*	Exhibit the objects and let the children name them. Tell the children that the objects which they have named are larger than you wish them to be, and so they shall be made smaller by being taken to pieces.
Examples.	Cotton, wool, silk, cane, and whale-bone are made up of fibres: these and all such substances are said to be fibrous—to possess the quality of fibrousness.	Let a child take the stick of flax and separate it into small pieces, and these again into smaller pieces. The class will see that the pieces that come off are all in the form of threads, and that these threads run along the length of the flax. Tell that each thread is called a fibre, and because the flax can be separated

Heads.	Matter.	Method.
		into a number of fibres it is said to be fibrous. Write substance as in opposite column. Get other examples and so work out the general definition.
II. FRIABILITY, *Idea and Name.*	When chalk is rubbed between the fingers and thumb it crumbles into very fine powder. Because it will do this it is said to be *friable.*	Let a child take the lump of chalk and separate it into very small pieces. Compare with the way in which the flax came to pieces—that into long threads, but this into fine powder. Put this fact into language as in the matter.
EXAMPLES.	Dry clay and very stale bread will crumble into powder, and so they are said to be friable. All such substances are said to possess the quality of friableness.	Get or give other examples, and so lead to the general conclusion as in opposite column.
III. SUMMARY.		1. Children to read what has been written on the slate during the lesson. 2. Question on the nature of the qualities. 3. To define the qualities. 4. To give examples of substances possessing the qualities.

Students to construct a Sketch on another group of qualities. For various groups, see "Common Things," pages 318–338.

The subjects of Reading, Arithmetic, Grammar, Moral Instruction, and Scripture, do not readily lend themselves to the "matter" and "method" form of sketch: those that follow on some of those subjects are arranged on a different plan.

We give some examples of the method of dealing with first lessons on Rules of Arithmetic.

THE MENTAL MULTIPLICATION OF 2.

I. Recapitulation of the Addition of 2.—Question this out, and place the twos in a series, thus:

2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2

II. Idea of Multiplication.—As each separate two is added place a figure above it to denote the number of times it has been taken, and then place *under* the twos the sum thus obtained, when the table will appear thus:

1	2	3	4	5	6	7	8	9	10
2 +	2 +	2 +	2 +	2 +	2 +	2 +	2 +	2 +	2
2	4	6	8	10	12	14	16	18	20

Next construct the ordinary multiplication table.

1. Lead the children to see that the numbers in the bottom row have been obtained by taking the twos a certain number of times, or by what is called multiplying the two by a certain other number.

2. Rub out the plus sign between each two, and substitute the multiplication sign between the upper and lower figure, thus:

2	2	2	2	2	2	2	2	2	2
×	×	×	×	×	×	×	×	×	×
1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20

children repeating Two taken once is two; Two taken two times or twice are four, &c.

3. Place the results in the ordinary way, and so construct the table thus:

2 × 1 = 2
2 × 2 = 4
2 × 3 = 6
2 × 4 = 8
2 × 5 = 10 up to
2 × 10 = 20

III. Learning the table.

1. Children to repeat the table from sight in various ways.

2. Turn the slate and children repeat from memory in various ways.

3. Question on the table promiscuously.

4. Children to reproduce the table on their slates.

5. Apply the multiplication to common calculations.

Students to construct a Sketch on another number—say the multiplication of 7.

DIVISION BY 2 MENTALLY.

I. Recapitulation of the Multiplication of 2.—Children to repeat the multiplication of two, and as they give the numbers write them on the black-board, thus:

$$\begin{array}{l} 2 \times 1 = 2 \\ 2 \times 2 = 4 \\ 2 \times 3 = 6 \\ 2 \times 4 = 8 \\ 2 \times 5 = 10 \\ \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \\ 2 \times 10 = 20 \end{array}$$

II. The Division Table worked out:

1. Question the children on how many times two was taken to get two once; to get four twice; to get six three times, &c.

2. Question as to how many times two can be taken out or measured in two—once; how many times out of four; out of six, &c. As each result is obtained write it by the side of the multiplication. When done it will stand thus:

$$\begin{array}{ll} 2 \times 1 = 2 & 2 \div 2 = 1 \\ 2 \times 2 = 4 & 4 \div 2 = 2 \\ 2 \times 3 = 6 & 6 \div 2 = 3 \\ 2 \times 4 = 8 & 8 \div 2 = 4 \text{ up to} \\ 2 \times 10 = 20 & 20 \div 2 = 10 \end{array}$$

When the children see the connection between the two tables rub out the multiplication.

III. LEARNING THE TABLE:

1. Table to be repeated several times from sight. (*a*) from top to bottom; (*b*) from bottom to top.

2. Table to be repeated from memory as in previous exercise.

3. Question on the table promiscuously.

4. Apply the operation to common calculations.

Students to construct another Sketch on the Division by 7.

THE IDEA OF A FRACTION.

I. IDEA DEVELOPED.

1. Draw a line upon the slate and divide into two parts, measuring to show the children they are equal. Question on what has been done and the relation each part bears to the whole, letting them notice particularly that they both together equal the whole.

2. Next divide an apple similarly, the children noticing that the apple is divided into two parts or halves, both together making the whole.

3. Go through the same process with one or two other objects, so that the children may apply the idea generally. Next tell them that these equal parts are called halves, each a half.

4. Then inquire as to the means by which the half of anything is obtained. If anything is divided into two equal parts, what is the name given to each part? How many halves make a whole? To what are two halves equal? This repeated. Next divide the line into 3 and 4 equal parts, questioning the children as to what has been done, and proceed in the same manner with an apple or orange. The children will see that each of these parts

is called a fourth, fifth, &c., and then by reference to lines upon the slate they will also see that out of one whole we may have one half, two halves, or the whole; one third, two thirds, three thirds, or the whole; one fourth, two fourths, &c. Then repeat, two halves make a whole, three thirds make a whole, &c.

Next exercise the children by questions, thus: How many halves in a whole apple? How many thirds? How many fourths? How many half apples in two whole apples? How do you know there are 4 halves?

II. Mode of Expression.—Lead the children to see the necessity of having a short way to write down these parts, referring them to the previous way of writing down one half, one third, &c., then tell them that for one half we write $\frac{1}{2}$, for one third $\frac{1}{3}$, for two thirds $\frac{2}{3}$, &c. Question them so as to bring out that in each of these cases the figure below the line shows into how many pieces the apple, or the line, or the object was divided, and the figure above the line shows how many of these parts were taken. Examples required from the children.

III. General Name given.—Before giving the name, ask what we call the half of a line with respect to the whole, the third of an apple, &c. Tell them that another name for a part of anything is a fraction. Give the following definition: A part of a whole is called a fraction. Require them to mention all the fractions we have been talking about, viz. halves, thirds, &c.

IV. Application.—In order that the children may not confine the idea to these objects, ask various questions bringing in other objects, as: Suppose I divide a cake into four parts and take three of them, what part of the cake have I taken? Increase the number of examples, thus leading them to see that anything may be divided into

parts called fractions, as $\frac{3}{4}$ of a cake, $\frac{1}{4}$ of 1 lb., $\frac{2}{3}$ of a line, &c.

Students construct a sketch on the idea of the addition of fractions.

THE TABLE OF SQUARE MEASURE.

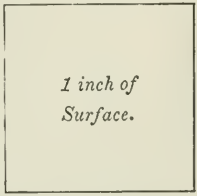
For Elder Children.

I. Introduction.—Children to repeat the table of Long Measure. Question as to its particular use—to measure the extent of anything in one direction, either its length or its breadth. Let the children suppose they had to cover the surface of the door with paint, and that they were to be paid one penny for every inch of surface painted. Before they could make a proper charge for their work they must find out how many inches of surface the door contains. This they could not do by the use of their Long Measure table, as that only determines the length of the door and its breadth, and not the extent of its surface or what is called its area. So they need another measure, and this will now be taught.

II. The Idea of Square Measure:

1. *The Square Foot.*

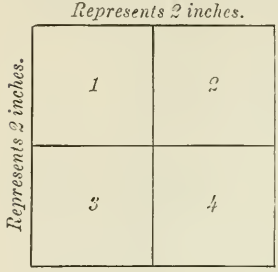
(*a*) Draw a line on the slate 1 inch long. Question as to its dimensions. One inch of length.



(*b*) Construct a square on this. Children to say what are its dimensions. An inch in length and an inch in breadth in all parts: it is an inch square. Write on the slate, "One inch square contains one square inch," and so we say "The square of one is one."

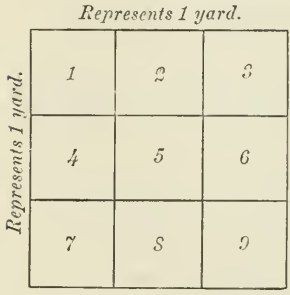
(*c*) Next draw a line two inches long, and construct a

square upon it. Question as to what extent of area is inclosed. Two inches in all parts. Measure off an inch in each line and then connect them. Children to say how many inches of surface there are in a two-inch square; namely, four inches. Repeat and write on the slate, "A two-inch square contains four square inches; or the square of two is four."



Proceed in the same way to construct squares on lines of three, four, five, and six inches. As each square is constructed question as to the number of square inches of area inclosed, and how found out. The length of the surface is multiplied by the breadth; and so the square of four is sixteen, the square of five is twenty-five, the square of six is thirty-six, and so on.

Suppose a line drawn twelve inches long. What called —a *foot*. Suppose a square constructed on this line, it will inclose a square foot of surface. Now if the length of the line, 12 inches, be multiplied by the breadth, 12 inches, what will it give? 144 inches, each inch a square. What then can they say? "144 square inches make one square foot." Write this on the slate. Children repeat it several times.

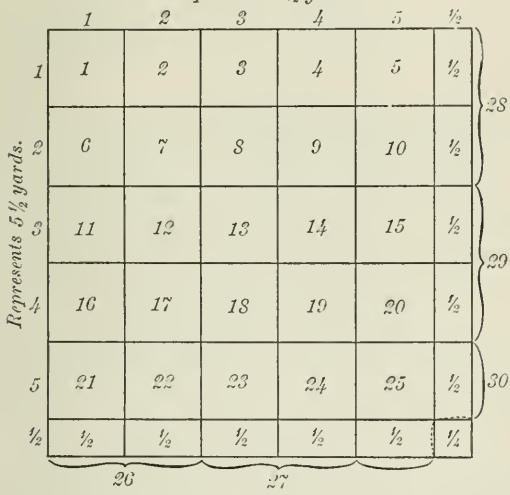


2. *The Square Yard.*—Draw a line to represent a yard; divide it into three equal parts. Question as to what these will represent—*feet*. Construct a square on this

line. Divide each side into three equal portions and unite them, thus:

Children count the number of squares—9. Say what each represents—a square foot of surface. What then can they say? "One square yard contains nine square feet; or Nine square feet make one square yard." Add this to what is written on the slate.

3. *The Square Pole.*—Draw a line to represent $5\frac{1}{2}$ yards. Mark off each yard and the half-yard, and then con-



nect them as in the diagram. Let the children count and put the numbers in each square, uniting the halves into wholes. Question as to how many wholes there are—25. How many halves—10. These equal to 5 wholes. Now $25 + 5 = 30$ and $\frac{1}{4}$. What then can they say respecting a square pole? It contains $30\frac{1}{4}$ square yards. Add

this to what is already on the slate: "$30\frac{1}{4}$ square yards make one square pole."

4. *The remaining portions of the Table.*—Tell the children that the same rule holds good with the other parts of the table, but the dimensions are too large to be represented on the slate. Add these to the other parts, when the table will stand thus:—

144	square	inches	make	one square	foot.
9	,,	feet	,,	,,	yard.
$30\frac{1}{4}$	,,	yards	,,	,,	pole.
40	,,	poles	,,	,,	rood.
4	,,	roods	,,	,,	acre.
640	,,	acres	,,	,,	mile.

III. Repetition of the Table:

1. Children repeat the table several times from sight.
2. Children repeat the table from memory.
3. Question on the table.
4. Children to make some simple calculations based on the table.

Students to construct a Sketch on Cubic Measure.

THE IDEA OF AN ADVERB.

I. Recapitulation—the Verb.—Children to give sentences and say which word is the verb. Then to give the office of the verb.

II. Idea of an Adverb developed.

1. *Manner.*—Write on the slate the following sentences: Mary works quickly. Jane works badly. The boy writes slowly. Charles draws carelessly, &c.

Children to point out the nouns and verbs; underline these. Then to examine the words not underlined—Quickly, &c. To which word in the sentences do they refer? The verbs. Yes, they are added to the verbs.

What do they tell us about the action expressed by the verb? They tell the manner in which they are done.

Tell that these words which tell the manner in which the action is performed are called *adverbs.* Write substance on the slate.

2. *Time.*—Write on the slate the following sentences: Mary writes often. Jane goes seldom. The boy will sing directly. Charles will play presently.

Question as to which word in the sentences, *often, seldom,* &c., refer. The verb. What do they tell us about the action expressed by the verb? When it is done, or the time.

Tell the children that these words are also called *adverbs.*

3. *Place.*—Write on the slate the following sentences: Mary wanders there. Jane works there. The ship came near. John wanders far. Charles has gone yonder.

Children to point out the verb in each sentence, then to say what the added words tell us about the actions expressed by the verbs. Where they are done, or the place. Tell children that these words are also called *adverbs.* What then can they say is the office of adverbs? To tell the manner, the time, or the place of the actions expressed by the verb.

III. Summary and Exercise.

1. Children to say what adverbs do.

2. Write sentences on the slate containing the three kinds of adverbs. Children to point them out and classify them.

3. Children to give other examples.

Students to construct a Sketch on "Adverbs modifying Adjectives and other Adverbs."

EXAMPLE OF METHOD OF DEALING WITH EXPLANATORY READING FOR UPPER STANDARDS.

One Verse of a Poem.

The Destruction of Sennacherib's Host at Jerusalem.

"The Assyrian came down like a wolf on the fold,
His cohorts were gleaming with purple and gold;
The sheen of their spears was like stars on the sea
When the blue wave rolls nightly on deep Galilee."

I. The verse to be read by the children as called upon, teacher correcting all mistakes of pronunciation. When correctly read, then, having given the name of the writer—

II. Explain the piece thus:

1. "*The Assyrian came down.*"—Refer to the history in 2 Kings, xix., and thus the children will decide who is meant here.

Judea and Assyria to be pointed out on the map, and thus give force to the expression "came down."

2. "*Like a wolf on the fold.*"—Show picture of wolf, and describe its nature—a fierce, bloodthirsty beast of prey. Refer to sheep: harmless, timid, defenceless, living under care of shepherd; place where kept at night called a "fold." Children decide why Sennacherib is compared to a wolf, and the Jews to sheep.

3. "*His cohorts were gleaming.*"—Refer to the divisions of our army into regiments of one thousand each; tell that the Assyrians divided theirs into companies of five thousand each, called a cohort. Show picture of our cavalry soldiers when mounted: helmets—breast-plates made of polished steel and brass. How they would look in the sun. Describe Assyrian soldiers, thus enabling the children to realize the picture.

4. "*The sheen of their spears.*"—Refer to what our soldiers use when they are engaged in war—some have lances; these made of polished steel. Picture out a number of such soldiers marching in the sunlight; their spears would glitter and flash: the brightness or glittering here called sheen.

5. "*Like stars on the sea.*"—Question as to whether any of the children have been by the sea-side on a moonlight night, or on a very bright starry night. If so, what they have observed about the moon and stars: they were reflected by the water, and as the water moved, the light seemed to dance about. Apply this to the Assyrian host marching in the sunlight, and so show the force of the expression.

III. Now have the verse read again, setting a model of style if necessary.

The reading to be (1) collective, and (2) individual.

Other verses to be treated in a similar manner.

INDEX.

Answers, dealing with. 44.

Description, 53.
,, conditions of successful, 53.
,, materials for, 55.

Explanation, common defects in, 52.
,, rule for, 52.
Exposition, nature of, 50.
,, rules for, 50.

Illustration, examples of, 46.
,, nature of, 45.
,, rules for use of, 49.
,, sources of, 48.
,, value of, 46.
Instruction, nature of, 8.
Instruments, the Teacher's, 25
Interrogation, 25.
,, its educational value, 25.

Lesson on Bodies Fibrous and Friable, 67.
,, the Cases of Nouns, 60.
,, the Cat, 63.
,, Classification of Verbs, 58.
,, the Cone, 56.
,, Cotton, 19.
,, the Daisy, 65.

Lesson on the Hedgehog, 18.
,, a Hen's Egg, 61.
,, the Idea of an Adverb, 76.
,, the Idea of a Fraction, 71.
,, Mental Division, 70.
,, Mental Multiplication, 69.
,, a Rule of Spelling, 57.
,, Table of Square Measure, 73.

Method, examples of, 21.
,, nature of, 21.

Oral Teaching, aids to successful, 9.
,, ,, causes of failure in, 7.

Pattern Sketches of Lessons, 56–77.
Preparation, careful, 9.
,, rules for, 10.

Questioning, examples of, 36–40.
,, method of, 29, 42.
,, rules for, 31–35.

Reading for Upper Standards, 78.

Sketch Writing, 10–20.
,, ,, violations of rules for, 11–20.

Teaching, nature of, 7.
Telling, forms of, 50.

26

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